
FINANCING **SUSTAINABLE ENERGY** PROJECTS
AT SMALL LIBERAL ARTS COLLEGES



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WHY SUSTAINABLE ENERGY? WHY SMALL COLLEGES?

The answers to these two questions are found at the heart of the Jessie Ball duPont Fund — who the Fund is and what the Fund does.

The Fund was established under the will of Jessie Ball duPont, a mid-20th-century philanthropist who cared deeply about education, particularly higher education. Throughout her adult life she helped young people attend college and supported a host of colleges and universities across the country.

Under the terms of Mrs. duPont's will, 330 assorted nonprofits and religious organizations are eligible for support from the Jessie Ball duPont Fund. Among these are 67 colleges and universities, 37 of which are small, private liberal arts colleges that were especially important to Mrs. duPont.

Today, these institutions wrestle with the challenges brought about by a rapidly changing culture and the increasingly uncertain economic landscape.

One of the fundamental aims of the Jessie Ball duPont Fund is building the capacity of the organizations that are eligible for support. For the Fund, "capacity building" goes beyond adding space and programs. It includes building the strategic ability of the organizations to adapt to a changing world, find new ways of doing business and sustain themselves over time.

In 2008, Jessie Ball duPont Fund President Sherry Magill and staff visited with many of the presidents of these small colleges, listening to their concerns and their aspirations, seeking to understand how they saw their institutions adapting to a changing world.

They heard worries about the rising costs of operating a campus and the inability to continue to pass those costs along to students and their families. And they heard an almost universal ambition to be good stewards of the places and people entrusted to them.

They also heard interest in supporting students' enthusiasm for a more environmentally friendly lifestyle—but much uncertainty about how to do that.

Informed by those conversations, the Fund in 2009 launched its Energy Conservation Initiative targeting eligible small, liberal arts colleges.

The immediate intent was to help institutions reduce their energy consumption and, thereby, reduce their operating costs. The longer term goal was to help institutions think of their campuses, their physical plants, as assets that can be managed for good, benefitting their students and their communities — growing their capacity by expanding their adaptability.

In short, the goal was both to reduce energy consumption today and encourage adapting to more sustainable energy practices down the road.

At the outset, the Energy Conservation Initiative offered small liberal arts colleges and universities support for:

- » Data Collection: energy audits, submeters and software to track and monitor energy use.
- » Energy Policies: establishing energy goals and ensuring compliance.
- » Co-curricular Programming: energy awareness projects designed to engage students, faculty, and staff in reducing energy consumption.
- » Staff and Training: energy managers, sustainability coordinators or others to implement the above, specifically to monitor and analyze submetering data, enforce energy policies, and engage the campus community in reducing energy use.

In the first three years of the initiative, 21 small private colleges accessed funding from the Jessie Ball duPont Fund to support these activities, and several began to see the potential benefits that larger energy conservation projects could have on their campuses and their bottom line.

But those larger projects often require a substantial up-front investment. Even though the rewards may be equally substantial going forward, colleges often struggle to make the initial investment, given so much competition for limited resources on campus.

In 2012, the Jessie Ball duPont Fund launched Phase II of the initiative, helping college and university leaders find sustainable ways of financing larger investments in energy operations on campus.

For this work, the Fund partnered with the University of North Carolina's Environmental Finance Center, which works to bring financial expertise to the challenge of addressing environmental issues. The center's staff works with governments and organizations to help them address environmental concerns in fair, effective and financially sustainable ways.

With the Fund's support, Environmental Finance Center staff participated in a webinar in late 2012 introducing leaders at the Fund's small colleges to

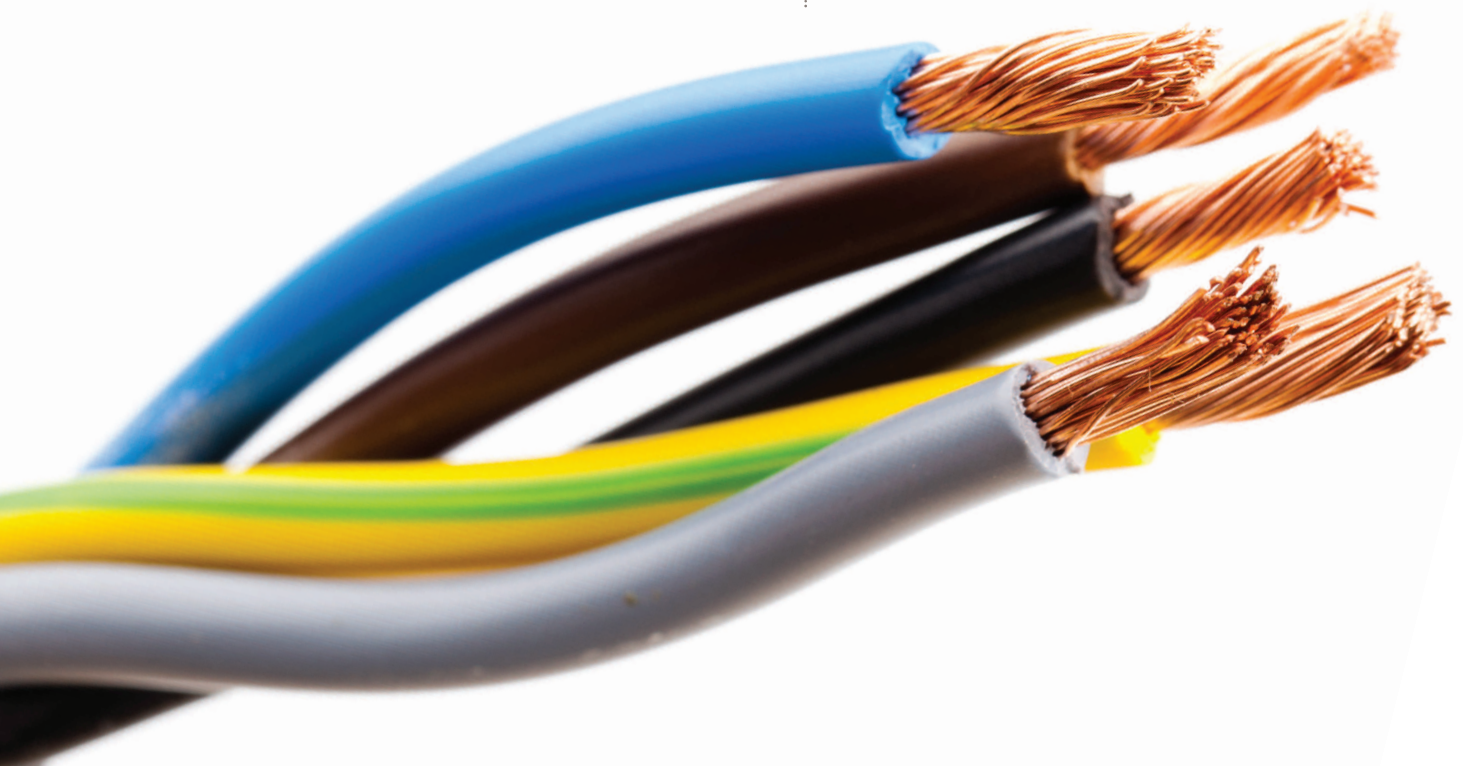
the concept of green revolving loan funds — small amounts of permanently held capital used to finance campus retrofitting projects and repaid from savings created by the retrofits.

The Fund then offered matching grants to colleges to help them seed their own green revolving funds.

But green revolving loan funds are not the only answer to financing energy-saving investments on campus.

In 2013, the Fund invited the Environmental Finance Center staff to visit two of the Fund's eligible colleges and assess their energy conservation activities and needs, and potential financing options. Using those two case studies as illustrations, the Environmental Finance Center staff prepared this guide to help colleges and universities better understand the options that are available and to provide a road map for decision-making.

The Jessie Ball duPont Fund is indebted to the Environmental Finance Center staff for their work. The Fund also wishes to recognize Ginny Hodges, Jessie Ball duPont Fund Fellow 2011-2013, for her enthusiasm, diligence and expertise in moving this work forward.





TOOLS FOR SUCCESSFULLY COMPLETING SUSTAINABLE ENERGY PROJECTS ON CAMPUS

Sustainability on college campuses is on the rise. More than 665 colleges nationwide have become signatories of the American College & University Presidents Climate Commitment, a network of college and university presidents and chancellors dedicated to promoting sustainability efforts on college campuses.

The Association for the Advancement of Sustainability in Higher Education (AASHE) defines sustainability as “encompassing human and ecological health, social justice, secure livelihoods, and a better world for all generations.” In other words, sustainability expands beyond pure environmental impacts and beyond college boundaries.

From the perspective of a small liberal arts college, sustainable energy projects are implemented for multiple reasons. Besides the obvious benefit of reducing annual energy expenditures, many colleges wish to reduce carbon emissions and develop climate action plans that require a deep understanding of their environmental footprint.

While the need to invest in energy conservation, energy efficiency and renewable energy projects has become widely accepted on campuses nationwide as a way to save money and promote campus sustainability, acquiring the upfront capital investment necessary for campus-wide sustainable energy projects is challenging for many colleges, particularly small colleges.

Schools must identify creative financing mechanisms that will allow them continual access to long-term capital for their energy projects.

We believe an expanded set of sustainable energy finance mechanisms targeted to colleges could be designed in a way that effectively links a wide range of investors to a diverse portfolio of energy projects. Ideally, these mechanisms should take advantage of the role colleges and universities play as facility managers, innovators, early adopters, educators, and researchers.

This guide focuses primarily on financing mechanisms. However, a financial solution alone will not allow a school to meet its sustainability, energy savings and carbon neutrality goals. Therefore, this guide outlines the four key steps necessary for investment into sustainable energy projects.

By considering these steps and reviewing the available financing mechanisms and case studies provided, a college will be able to prepare a prioritized list of projects, compare applicable financing mechanisms and develop an implementation strategy that will help it achieve its sustainability and financial goals.



STEP ONE

IDENTIFY “FUNDABLE” SUSTAINABLE ENERGY PROJECTS

For colleges, sustainable energy projects include:

- Energy conservation projects that reduce or eliminate usage to save energy; for example: occupancy sensors or programmable thermostats.
- Energy efficiency projects that use less energy to provide the same service and include (but are not limited to) weatherization and installation of more efficient lighting or heating, ventilation and air conditioning equipment.
- Renewable energy projects that involve the installation of renewable power generation equipment – solar panels, wind farms or biomass systems – and can be implemented on campus or offsite.

Colleges have many reasons for implementing projects, including lowering operating costs, reducing carbon emissions, improving building comfort and creating learning opportunities for students. Each college should develop its own prioritization criteria to match its particular needs.

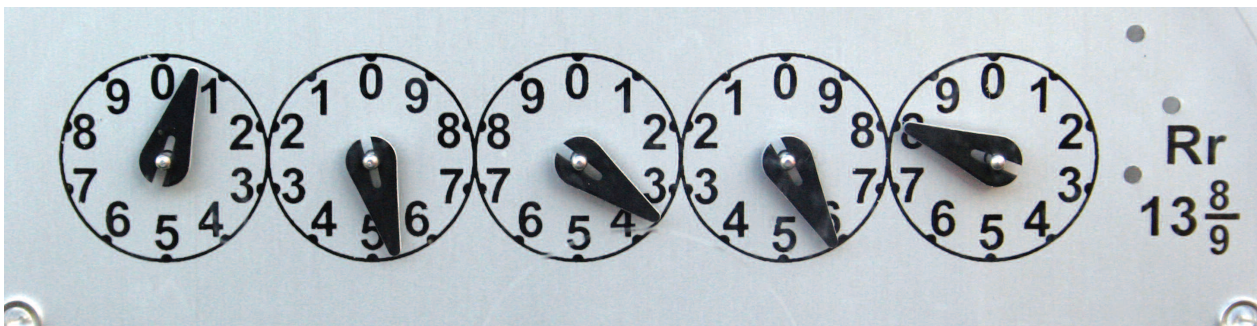
Many tools have been developed that can assist a college with the prioritization of its sustainable energy projects including the Association for the Advancement of Sustainability in Higher Education’s Sustainability Tracking, Assessment and Rating System (STARS); the Billion Dollar Green Challenge’s Green Revolving Investment Tracking System (GRITS); and the Environmental Protection

Agency’s Energy Star Portfolio Manager program. While financial criteria, such as simple payback or return on investment (ROI), will play a major role in project evaluation, many colleges are now using a more holistic “triple bottom line” approach that takes into consideration environmental and social benefits when evaluating projects.

These benefits are important from a sustainability perspective, but a college’s financial position must always play a role in the prioritization of projects. Some projects will lead to energy savings that can be incorporated into the project’s financing mechanism, while other projects, although achieving important sustainability objectives, may not generate savings and will require financial resources beyond what is available to the college.

Institutions interested in using a financing mechanism to support sustainable energy projects should have, at a minimum:

- » A list of viable projects;
- » A baseline energy audit;
- » The ability to measure energy use by building (using sub-metering if appropriate);
- » At least two years’ data on monthly energy costs by building;
- » Buy-in from all administrative, faculty and facilities staff.



STEP TWO

IDENTIFY AND ANALYZE IMPLEMENTATION CHALLENGES

Colleges face many challenges in implementation that can stymie reaching sustainability goals. Each college must identify its specific challenges and select appropriate strategies to overcome them. Common challenges facing small colleges trying to finance sustainable energy projects and potential solutions are described below.

Challenge: Finding reliable projects with accurate energy savings estimates.

Solution: Many organizations, including potential funders, offer free or low-cost energy audits that precede the application for financing.

Challenge: Inadequate or limited capital.

Solution: Financing strategies that combine sustainable energy projects with large capital projects can lead to higher long-term returns on investment and improved cash flow.

Challenge: Limited access to debt financing.

Solution: Tapping into off-balance-sheet financing systems, such as properly designed on-bill repayment, energy service agreements or third-party equipment leasing, may enable a school to take on a project as an operating expense.

Challenge: Operating budget constraints.

Solution: Some donors and alumni are willing to commit funds to cover energy project costs as a way of investing in the future of colleges.

Challenge: Measurement and verification.

Solution: New technologies such as smart meters and more accessible software now provide excellent tools to measure and track energy usage.

Challenge: Accounting systems and budgeting procedures.

Solution: Payment neutral financing solutions like on-bill repayment, energy savings contracts and green revolving funds can make it easier to capture and “monetize” avoided energy cost savings.

Challenge: Distribution of incentives.

Solution: Careful attention to publicizing and sharing benefits can build a team effort. Low-cost gestures such as holding a “pizza party” for a department that successfully demonstrates energy savings can go far.



STEP THREE

FIND THE RIGHT FINANCING MECHANISM(S)

A long list of financing mechanisms is available to help colleges fund their sustainable energy projects.

SELF-FINANCING USING CASH AND GRANTS

A college may self-finance its sustainable energy projects on a “pay-as-you-go” basis using money carved out of its existing utility or capital budget. Or colleges may apply for grant funding from a private, federal or state organizations. While grant funding can offer a college a debt-free way to finance projects, it often requires significant planning and documentation, is generally designated for specific purposes and is a relatively scarce financial resource.

GREEN REVOLVING FUND

A green revolving fund is a financing mechanism designed to leverage investment from one or more sources. The energy savings (or portion of the savings) -- calculated as the avoided energy costs resulting from each project -- are tracked and returned to the green revolving fund and can be used to finance new projects. As reductions in energy costs are realized, the green revolving fund is repaid from the avoided energy costs.

ENERGY SAVINGS CONTRACTS

An energy savings contract is a partnership between the school and an energy service company (or ESCO). The ESCO conducts a comprehensive energy audit for the school, identifies projects that reduce energy use and save energy costs, designs and constructs the projects, and arranges the necessary funding. In most cases, the ESCO guarantees that the improvements will generate energy cost savings sufficient to pay the full cost of the project, provides the ongoing maintenance and conducts measurement and verification of savings over the term of the contract (up to 25 years). At the end of the contract term, all additional energy cost savings accrue to the school as part of the original agreement.

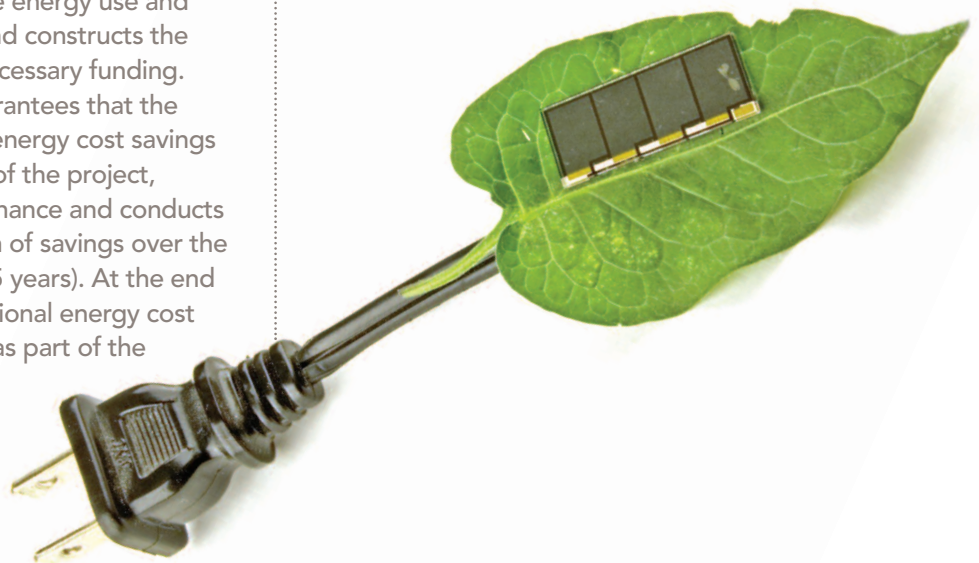
ENERGY SERVICES AGREEMENT

Energy (or efficiency) services agreements, sometimes referred to as “pay for performance” financing, are a variant of the financing provided using an energy savings contract. An energy services agreement is structured so a third party develops the project, arranges the financing and manages the installed equipment, usually working directly with an energy services company on behalf of the school. In this way, the payment for services can be considered a pass-through operating expense as energy costs are avoided. In other words, colleges make a payment for management of facilities in an amount equal to or lower than they would have paid directly to utility providers.

EXTERNAL DEBT FINANCING

One of the most common methods of financing energy projects relies on colleges using external debt to fund the capital costs of major projects. This can include loans from commercial banks, credit unions, and community development financial institutions, but can also include program related investments from endowment funds and a variety of government bonds.

The funds received from these sources can be used to fund specific campus projects or combined with other financing mechanisms such as energy savings contracts and green revolving funds.



ON-BILL REPAYMENT — AN EMERGING FINANCING ALTERNATIVE

On-bill repayment programs enable building owners to repay loans for eligible energy efficiency and renewable electricity generation projects through their monthly utility bills.

Many versions of utility on-bill repayment partnerships exist. In some cases, the utility provides a loan directly to a customer; in other cases, a third party (usually a bank or credit union) provides the funding and the utility's primary role is administrative - billing and payment processing.

In any of these models, a utility could be involved with marketing, qualification of contractors, and project inspection. In all cases, the utility agrees to collect monthly payment for the repayment of the loan. These loan payments are part of the customer's monthly utility bill and, once collected, are used to repay the customer's loan obligation.

The goal of most of these programs is for the customer's bill to remain "payment neutral" – the total amount paid to the utility remains the same – since the reduction in energy expenditures offsets the increase in the utility bill associated with the loan payment.

Benefits of an on-bill repayment program include:

Payment neutrality – Savings are matched with costs resulting in a single monthly bill for both energy and debt repayment that matches or is lower than the customer's existing energy bill.

Lower rates and better terms - Default rates on utility bills tend to be far lower than on other debts, such as mortgages and credit card balances.

EXAMPLE:

| | |
|--|----------|
| Cost of energy efficiency upgrade | \$40,000 |
| CURRENT month utility bill (before upgrade) | \$2,333 |
| Reduction in monthly energy costs due to upgrade | (\$583) |
| Monthly loan payment (6% interest over 7 years) | \$583 |
| NEW utility bill (reduced energy use + loan payment) | \$2,333 |

Therefore, lenders can offer lower interest rates, longer maturities and better terms for an on-bill repayment loan.

Off-balance sheet financing – Payments to the utility for debt repayment may, in some cases, be considered an operating expense and not reflected on the college's balance sheet as debt. This would be beneficial to colleges that have debt restrictions.

The financial analysis for testing the impacts of on-bill financing are quite similar to the financial analysis for other mechanisms, such as green revolving funds. Below is an example of the savings (through avoided energy costs) that a college could realize if on-bill repayment was used to fund its sustainable energy projects. In this analysis, it is assumed that all recommended energy conservation measures are implemented at the same time.

If you are interested in on-bill repayment programs, contact your college's electric or natural gas utility to find out if such programs are offered in your area.

| | ANNUAL | MONTHLY AVG. |
|---|--------------------|--------------|
| Cost of Upgrades (amount of loan) | | |
| \$3,584,000 | | |
| Interest rate on loan | | |
| 6% | | |
| Length of repayment | | |
| 10 (years) | | |
| Current annual energy expenditure | \$ 1,557,266 | \$ 129,772 |
| Less: Energy costs avoided (utility bill savings) | \$ (542,029) | \$ (45,169) |
| Plus: Monthly principal & interest payment | | \$ 39,790 |
| NEW utility bill (energy use and debt repayment) | | \$ 124,393 |
| Difference in monthly expenditure | \$ 5,379 per month | |
| | \$ 64,552 per year | |

STEP FOUR

MEASURE AND VERIFY THE PROJECT'S IMPACT

Once a sustainable energy project has received financing and been implemented, a key to measuring the success of the project is to calculate the actual reductions in energy use. This will not only help with the internal accounting for self-financed projects and green revolving funds, but is a necessary component for the repayment of many third-party financing mechanisms.

In order to calculate the actual savings from implemented projects, a college must have a strategy to provide measurement and verification of the actual energy reductions.

Most colleges can measure reductions in energy use internally by examining monthly utility bills to compare actual usage after the sustainable energy improvements to baseline usage before the implementation of the project. However, many colleges will be required to have a third party verify the actual savings using direct measurement and computer simulation. This is an additional on-going cost that must be considered and can be as much as 10 percent of estimated energy savings.

There are many reasons for implementing measurement and verification procedures that go beyond merely tracking reduced energy usage. Measurement and verification can:

- » Accurately assess energy savings for a project;
- » Monitor equipment performance;
- » Improve operations and maintenance;
- » Verify that the cost savings guarantee is met (for energy savings contracts and energy services agreements);
- » Reduce cost of financing (less risk and uncertainty);
- » Increase awareness of sustainable energy initiatives on campus;
- » Find areas for additional savings;
- » Maximize energy savings by allowing for future adjustments as needed.

Every sustainable energy project involves some degree of uncertainty. Measurement and verification is critical to understanding the actual energy savings associated with energy improvement projects in a way that enables the college to overcome the uncertainty and successfully execute its sustainable energy plan.

OTHER CONSIDERATIONS

Many colleges hope that they can finance sustainable energy improvements in a way that is cash flow neutral – in other words, the avoided costs from the project more than offset annual costs associated with financing the capital investment. While in some circumstances there are projects that can be structured in this way, in other cases the need for the projects are so great that the benefit of installation is as much about building performance as it is about reduced energy use. In some cases, building energy retrofits can even increase costs – for example, the replacement of air conditioning or lighting systems that are broken or not in service prior to the upgrade. These inefficient systems that are not in operation might use less energy than a high performing efficient system that is actually in use providing light or air conditioned space. In these situations, the financial analysis should focus on least-cost solutions rather than cost-neutral solutions and

consider the impact on building users as much as on the reduction in energy costs.

From a more pragmatic perspective, many energy finance mechanisms bundle or aggregate projects and strategically group lower return on investment projects with higher return projects to allow for a wider array of project implementation. The risk of focusing entirely on a project-by-project single bottom line analysis and implementation approach is that invariably lower hanging fruit projects are completed first in isolation, leaving projects with strong environmental and social returns but weaker financial returns remaining perpetually on a “to do” list.

By considering the four steps outlined in this guide, each college can prepare a prioritized list of projects, compare applicable financing mechanisms and develop an implementation strategy that will help it achieve its sustainability and financial goals.





FINANCING SUSTAINABLE ENERGY PROJECTS THROUGH A MULTI-CAPITAL SOURCE GREEN REVOLVING FUND

ABOUT FERRUM COLLEGE

Ferrum College is a liberal arts institution founded in 1913 and located in Ferrum, Virginia. The student population consists of 1,500 men and women and offers 33 areas of study including Environmental Planning and Development and Environmental Sciences. Ferrum is located in a humid climate with mild winters that requires extensive cooling in the summer months and heating from October through April. Ferrum has more than 900,000 square feet of building space and relies on a variety of energy sources including electricity, natural gas, oil, and propane. Electricity alone cost the college more than \$650,000 during the 2011-2012 school year, and reducing and optimizing energy usage is an important goal for the college.

BACKGROUND

Ferrum's president, Jennifer Braaten, signed the American College and University Presidents' Climate Commitment on April 30, 2007, and in February 2012, a group of faculty and staff outlined a draft proposal to reach carbon neutrality by 2037. As currently proposed, carbon neutrality will be accomplished in three phases:

Short-term (2012-2021): 40% reduction in carbon footprint.

Mid-term (2022-2030): 30% reduction in carbon footprint.

Long-term (2031-2037): Final 30% reduction, with net zero carbon emission by 2037.

In 2007, Advanced Energy, an energy efficiency-focused non-profit corporation based in Raleigh, N.C., was hired by Ferrum to conduct a campus energy audit. The report summarized several energy savings opportunities – including lighting retrofits, preventative maintenance and heating, ventilation and air conditioning improvements. With grant funds from the Jessie Ball duPont Fund, the college was able to install electric sub-meters on all campus buildings, establish campus-wide sustainable energy improvements and hire its first sustainability coordinator to focus on energy conservation awareness, recycling programs and sustainable food practices on campus.

In 2011, Ferrum College partnered with English Biomass Partners, LLC, a division of English Boilers, headquartered in Richmond, VA, to build the English Biomass Energy and Research Complex. When completed, the complex will house two

biomass boiler units. The larger unit is a combined heat and power facility that will provide approximately 65% of the campus heat and hot water using wood by-products. The second, much smaller, unit is a research and development boiler to be used in classroom situations and to test the energy capacity of different biomass materials.

As currently installed, the biomass boiler is capable of providing a small portion of Ferrum's electrical energy, however, the college has the option to expand its capacity to 1 megawatt depending on its needs. With low wood prices in Virginia and the rising cost of fuel oil, the biomass boiler is advantageous to Ferrum College on many levels.

Ferrum College has relied on a mix of internal and external funds to carry out past sustainable energy initiatives. Funders such as the Jessie Ball duPont Fund have been critical to accelerating implementation of many initiatives including the installation of sub-meters on all buildings and the implementation of upgraded lighting and occupancy sensors.

Historically, Ferrum College has used limited debt financing for sustainable energy projects but could expand its use of debt financing.

In addition, one of the college's key utility providers, Appalachian Power, a subsidiary of American Electric Power, has made several generous gifts to the school. The utility company also offers some limited energy financial incentives mainly in the form of rebates but does not currently offer energy efficiency or renewable energy loan programs.

The college has indicated an interest in starting a green revolving fund and has signed on with the Billion Dollar Green Challenge. Ferrum has considered working with energy savings companies to perform some of their heating and cooling upgrades; however, it would prefer to fund the improvements through its own operating budgets.

PROJECT OVERVIEW

Ferrum has made significant progress in the implementation of its sustainable energy projects and is moving forward with planning larger, high-impact projects. According to college representatives, the most important of these are:

Energy Management System - Offering a consolidated look at the energy use in each building, campus facility managers can easily view energy usage in real time and reduce the college's resource consumption from a centralized location. An energy management system enables the automation of temperature setbacks for heating and air conditioning units during periods when buildings are unoccupied, resulting in utility bill savings that can approach 15 to 20 percent or more per month.

Library chiller and other heating and air conditioning upgrades - High on the list of upgrades is a water-cooled chiller located in the school's 62,000-square-foot main library. Trane Building Services has provided Ferrum College with a \$500,000 project cost to replace the chiller with a 150 ton air-cooled chiller and upgrade the energy management system.

Energy Manager - A dedicated energy manager can analyze potential energy savings, manage projects and measure results. Because an energy manager is essential to the success of the energy management plan and represents an important cost, the position has been included in this financial plan to provide a realistic assessment of costs and benefits.

In addition, Ferrum has identified other heating and lighting modifications and retrofits in multiple buildings.

FINANCING MECHANISMS

Ferrum College has a number of financing mechanisms in place or under consideration that it can use to fund its sustainable energy projects including an energy savings contract and, in the case of the biomass boiler, an operating lease agreement. However, considering the types of projects and the college's potential access to diverse sources of capital, the college also should consider a green revolving fund to offer flexibility in timing project implementation.

Green revolving funds leverage investment from one or more sources (sometimes referred to as seed money). The energy savings (or portion of the savings), calculated as the avoided energy costs resulting from each project, are tracked and returned to the green revolving fund and can be used to finance new projects.

For example, if a sustainable energy project costs \$50,000 to implement and after completion, the college realizes \$10,000 in annual avoided costs, the green revolving fund would be repaid in five years through a transfer of the "avoided" costs to the fund.

(It is important to think of savings as avoided energy costs not simply as a net reduction in utility bills because in many situations, a college's overall expenditures may still rise even after efficiency project are implemented due to space expansions or inevitable utility price increases.)

Green revolving funds can be set up using one type of initial investment (i.e. from student fees); however, for small colleges such as Ferrum, a robust program likely will require that the initial investment into the fund come from multiple sources.

Possibilities at Ferrum College include:

Operating Budget – Colleges can record and track sustainable energy project allocations from operating, administrative, or utility budgets as investments linked to recurring revenue streams rather than simply as a one-time expenditure. Under this model, the impact of using operating expenditures for energy-saving projects is more transparent and funds tied to energy savings can be used to fund future sustainable energy projects.

Student Fees – Many colleges use student fees to fund green programs, with fees assessed per student each semester. Typically, students are more involved in project selection when the green revolving fund uses student fees as a capital source.

Endowment Fund Investment – Most endowment fund portfolios include allocations to low risk investments with guaranteed, modest returns. A green revolving fund can be structured to serve as a low-risk, modest interest producing investment for a small amount of endowment funds. Endowment funds would be treated strictly as an investment with complete repayment of principal and interest designed into the green revolving fund operation.

Alumni Donations – Colleges can solicit gifts/donations from alumni specifically to fund sustainable energy projects through the

capitalization of a green revolving fund. Because of the revolving nature of the fund, colleges can demonstrate the leveraging impact of green revolving fund gifts.

Grants – Funds received from sustainable energy grants, including grants from the Jessie Ball duPont Fund, can serve as “seed capital” for a green revolving fund.

External Bank Loans – Many banks, including regionally focused community development financial institutions (CDFIs), are beginning to finance community energy projects with low interest rates. A direct loan made to a green revolving fund that includes other sources of capital can expand the capacity of the fund while being secured by the stream of attached revenue from funded projects.

CONCLUSION & RECOMMENDATIONS

While Ferrum College has signed on to the Billion Dollar Green Challenge, it has not established its own green revolving fund to date. The Environmental Finance Center recommends the multi-capital source green revolving fund as a mechanism to finance energy projects over time. Once the green revolving fund is established, Ferrum can use it to make investments into sustainable energy projects and the resulting avoided energy cost savings can

be used to pay principal and possibly interest back into the fund for future projects.

As the following simplified example shows, with initial seed capital of \$200,000, a green revolving fund at Ferrum College has the potential to fund over \$400,000 worth of sustainable energy projects in three years if 100% of the savings are returned to the green revolving fund.

| Source of Funds: | Use of Funds: | | |
|--|---------------------------------------|------------------|-------------------------|
| Jessie Ball duPont Fund Grant \$100,000 | Year One Projects | PROJECT COST | ANNUAL SAVINGS YEAR ONE |
| Operating funds \$ 25,000 | Heat exchangers | \$ 98,000 | \$ 57,000 |
| Matching grant \$ 25,000 | Central plan modifications | \$ 52,000 | \$ 30,000 |
| Alumni donations \$ 50,000 | Energy manager | \$ 50,000 | \$ 10,000 |
| Total amount in fund: \$200,000 | | \$200,000 | \$ 97,000 |
| | Year Two Projects | | |
| | Library lighting retrofit | \$ 10,861 | \$ 3,989 |
| | Garner Hall lighting retrofit | \$ 32,860 | \$ 4,008 |
| | Other sustainable energy project | \$ 53,279 | \$ 5,000 |
| | | \$ 97,000 | \$109,997 |
| | Total projects in two years: | \$297,000 | |
| | Total projects in three years: | \$406,997 | |

FINANCING SUSTAINABLE ENERGY PROJECTS THROUGH AN ENERGY SERVICES AGREEMENT

ABOUT EDWARD WATERS COLLEGE

Founded in 1866, Edward Waters College is a small, private, historically black, liberal arts college. It was founded to educate freed former slaves and is the oldest historically black college in Florida. The college has approximately 800 students with nine degree programs and 31 full-time faculty members. Edward Waters College is located in Jacksonville, FL, a humid, sub-tropical climate with mild winters and hot summers. The campus has 25 buildings, all of which are sub-metered, and approximately 286,000 square feet of building space. The college's energy expenses totaled approximately \$650,000 during the 2011-2012 school year, primarily from electricity and, to a smaller extent, natural gas.

BACKGROUND

The Sustainable Campus Committee at Edward Waters College set a goal to reduce the college's 2009 carbon emissions by 20% by 2020. An energy audit prepared in 2009 by Sodexo identified nine low-cost/no-cost projects with a potential avoided energy cost savings of \$98,298 (equivalent to 15.4% of projected total energy costs if no projects are implemented).

The estimated total project cost was \$442,324 and the projects focused primarily on lighting retrofits, building automation improvements, and heating, ventilation and air conditioning (HVAC) upgrades.

In 2012, Edward Waters College received a grant from the Jessie Ball duPont Fund to purchase and install 26 phase inducers in the highest energy consuming buildings on campus. Phase inducers improve the electrical efficiency of equipment and can reduce energy consumption by up to 15 percent. Installing the phase inducers is estimated to save the college up to \$30,000 annually and protect valuable equipment, such as roof air conditioning units and lab instruments, from power surges.

The college has installed 11 of the phase inducers and planned to install the other 15 in June 2013.

Edward Waters College has entered into a Green Technologies Partnership with its local utility company, JEA. The partnership provided the college with a \$56,000 solar panel array, which the college hopes to install on the roof of

its main science building, one of the largest energy consuming buildings on-campus, to use for research and education purposes. The college plans to install the 10.5 kilowatt solar system during the summer of 2014.

Edward Waters College has been quite successful in developing partnerships with local organizations in the Jacksonville community. In addition to its grant from the Jessie Ball duPont Fund and partnership with JEA, the college received a \$50,000 Green Grant from the City of Jacksonville to do a lighting retrofit for the school's gym (the Adams-Jenkins Sports Complex) and dorms. The college replaced the gym's 400 watt metal halide lights, added sensors on lights in the dorms and programmed the buildings' automation systems. The school's administration plans to put aside an amount equal to the estimated avoided energy expenditures linked to these projects to initiate a revolving loan fund to provide funding for additional sustainable energy projects.

The college has applied for a \$137,000 research grant to be used in conjunction with the solar panels received from JEA. Although the grant cannot be used to fund the installation of the panels, it can be used to enhance the system's capabilities as a research tool for engineering, physics, and biology students.



PROJECT OVERVIEW

Based on the initial work done in the 2009 energy audit, the sustainable energy projects at Edward Waters College fall into three categories:

Lighting retrofits – The T-12 and incandescent lighting used in most buildings needs to be upgraded to more efficient T-8 and compact florescent lighting.

Building automation system improvements – Only one school building currently uses a building automation system to control heating and cooling. The college needs automation systems installed in all buildings to effectively control building temperatures and monitor set-backs, which will improve the efficiency of the buildings.

HVAC upgrades – The college is heated by various methods including central systems, heat pumps, electric strip heating, and packaged thermal air conditioner units. Cooling is accomplished mainly by larger air cooled chillers for bigger public spaces with split systems and packaged thermal air conditioning units for individual dorm rooms and smaller administrative offices. Electric water heaters supply most of the domestic hot water. A few larger spaces, such as the Student Union building, use natural gas boilers. All of the equipment is aging and requires significant upgrades to increase the efficient use of electricity and natural gas.

While Sodexo's initial estimate for these projects totaled almost \$500,000, it now estimates that performing a comprehensive energy efficiency retrofit to the entire campus would cost approximately \$1 million.

FINANCING MECHANISMS

Edward Waters College has a number of financing mechanisms it might consider to fund its sustainable energy projects.

One alternative would be to have the college employ debt financing to fund the initial capital expense. Alternatively, it could fund the overall program on a project-by-project basis as funds become available. A variation of this approach would be to better track and reserve the avoided costs from each project and create a green revolving fund able to access both new funds as well as the revolved savings. It could continue to work with foundations and other grant organizations to augment school funds on a case-by-case basis. Similarly, it could ask for assistance from its utility company and donors for additional support.

While all of these financing mechanisms are potential alternatives, the college has been considering the use of a third party-financed energy services agreement to fund its sustainable energy projects.

Energy Services Agreement - Energy (or efficiency) services agreements, sometimes referred to as 'pay for performance' financing, are a variant of the financing provided using an energy savings contract.

Energy savings contracts allow organizations to undertake sustainable energy projects by relying on debt that is linked to a portfolio of projects deemed to provide guaranteed savings from avoided energy costs in an amount greater than or equal to debt service payments. Colleges generally must list energy savings contracts as debt on their balance sheets.

On the other hand, by structuring the arrangement more as an annual service agreement than as a long-term capital contract, colleges are often able to classify the contracted building services as an operating expense and (subject to institutional and state accounting procedures) list the energy services agreement off-balance sheet.

An energy services agreement is structured so a third party develops the project, arranges the financing, and manages the installed equipment, usually working directly with an energy services company on behalf of the school. In this way, the payment for services can be considered a pass-through operating expense as energy costs are avoided.

In other words, colleges make a payment for management of facilities in an amount equal to or lower than they would have paid directly to utility providers.

Typically, the college enters into an energy services agreement directly with a third party financial partner. This partner pays and manages an energy services company to implement and maintain the project. The third party financial partner retains ownership of all project-related assets for the term of the agreement and pays for maintenance services. In each pre-determined billing period, project performance is quantified using agreed-upon measurement and verification protocols. These verified savings provide the basis for the service charge paid by the college to the third party financial partner.

FINANCIAL ANALYSIS

In June 2012, Edward Waters College began initial discussions with Sodexo, its current facilities management provider, to analyze campus sustainable energy projects and develop a plan for implementation.

Sodexo, working in partnership with Metrus Energy, a third party financial partner, has made a proposal to provide \$1 million in energy efficiency improvements to the college's buildings, including lighting and heating, ventilation and air conditioning upgrades and the installation of building automation control systems, occupancy sensors and water saving fixtures.

The proposal details an energy services agreement between Edward Waters College and an LLC formed between Sodexo, Metrus Energy, and private investors. An energy services company, Trane, would provide the equipment and measure and verify the actual energy cost savings every six months. If savings are not realized, Edward Waters College pays nothing to the LLC. If savings are realized, they are shared between the two entities (10% to Edward Waters College, 90% to the LLC), resulting in no upfront costs for the college. The assets are owned by the LLC for a 10-year term and then transferred to Edward Waters College, which would then benefit from 100% avoided project costs.

Sodexo currently provides facilities management for Edward Waters College and has been on site preparing a feasibility analysis and preliminary model for the energy services agreement. As of this writing, Sodexo has not presented a final proposal to Edward Waters College's President and Board of Directors.

According to information provided by Sodexo during a recent telephone conversation, the proposed energy services agreement will result in estimated annual avoided energy costs of \$180,000 to \$250,000.

If the college decides to move forward with the analysis of an energy services agreement, an investment grade audit will be completed to determine the total cost of the project and the estimated energy savings. Beyond improved building performance and comfort, the final net financial benefit to Edward Waters College will depend on a number of factors including project selection, current and future energy prices, source of capital financing, and profit requirements of energy service providers.

Many colleges hope that they can finance sustainable energy improvements in a way that is cash flow neutral – in other words, the avoided costs from the project more than offset annual costs associated with financing the capital investment. While in some circumstances there are projects that can be structured in this way, in other cases the need for the projects are so great that the benefit of installation is as much about building performance as it is about reduced energy use. In some cases, building energy retrofits can even increase costs – for example, the replacement of air conditioning or lighting systems that are broken or not in service. These inefficient systems might use less energy than a high performing efficient system that is actually in use.

In these situations, the financial analysis should focus on least-cost solutions rather than no-cost solutions and consider the impact on building users as much as on the reduction in energy costs.

CONCLUSION & RECOMMENDATIONS

Edward Waters College has approximately \$1 million in energy conservation projects, but limited capital to fund them. An energy services agreement could provide the capital for these projects, however the true return to the college will need to be analyzed based on the proposal details. Implementing an energy services agreement, particularly for a smaller institution, does come with important costs that are not always factored into the financial impact calculations. In the case of Edward Waters College, the ability to enter into an agreement requires the completion of an investment grade audit that is currently estimated to cost \$50,000. Overseeing these types of agreements can be challenging and will require

dedicated staff time — contributions that carry an important cost that cannot be overlooked. Some colleges entering into these types of agreements turn to outside consultants to help them ensure that the terms of the agreement are followed.

Based on the concern over the capacity to manage this type of agreement and the cost of an investment grade audit, Edward Waters College may decide to develop a more ambitious green revolving fund as an alternative to the energy services agreement. If this option is selected, the college will need to ensure that the appropriate procedures are put into place to measure and verify the energy reductions and track the savings.

ENERGY FINANCE RESOURCES

GENERAL INFORMATION FOR HIGHER EDUCATION SUSTAINABILITY

American College and University Presidents' Climate Commitment – The President's Climate Commitment is a network of colleges and universities that have made institutional commitments to eliminate net greenhouse gas emissions from specified campus operations. Its mission is to accelerate progress towards climate neutrality and sustainability by empowering the higher education sector to educate students, create solutions, and provide leadership-by-example for the rest of society.

<http://www.presidentsclimatecommitment.org/>

Association for the Advancement of Sustainability in Higher Education – The association provides resources, professional development, and a network of support to enable institutions of higher education to model and advance sustainability in all aspects of campus operations, from governance and operations to education and research.

<http://www.aashe.org/>

Environmental Protection Agency's ENERGY STAR for Higher Education – ENERGY STAR is a voluntary government-industry partnership offering a suite of resources and tools to help businesses, government agencies, organizations, and consumers become more energy efficient in the workplace and at home. ENERGY STAR for Higher Education provides an energy management strategy to help colleges and universities save money for repair and renovation, hiring of new faculty, new construction, and other core activities.

http://www.energystar.gov/index.cfm?c=higher_ed.bus_highereducation



PROJECT PRIORITIZATION AND TRACKING RESOURCES

Sustainability Tracking, Assessment and Rating System™ (STARS) - The Sustainability Tracking, Assessment & Rating System is a transparent, self-reporting tool for colleges and universities to measure their sustainability progress. The system includes environmental, economic, and social indicators, which are divided into four categories related to campus activities: education & research, operations, planning, administration and engagement, and innovation.

<https://stars.aashe.org/>

Green Revolving Investment Tracking System (GRITS) - The Green Revolving Investment Tracking System is designed to manage every aspect of an institution's green revolving fund including aggregate and project-specific tracking of financial, energy, and carbon data.

<http://greenbillion.org/grits/>

Energy Star's Portfolio Manager - Portfolio Manager is an interactive energy management tool that allows an organization to track and assess energy and water consumption across its entire portfolio of buildings in a secure online environment. Portfolio Manager can help set investment priorities, identify under-performing buildings, verify efficiency improvements, and receive EPA recognition for superior energy performance.

http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager

FINANCING MECHANISM RESOURCES

The Sustainable Endowments Institute and the Association for the Advancement of Sustainability in Higher Education, "Green Revolving Funds: An Introductory Guide to Implementation and Management" – The introductory guide provides a broad overview of the green revolving fund model, practical guidance on how to set up a fund, and examples and best practices gleaned from on-the-ground experience of managing a green revolving fund.

http://greenbillion.org/wp-content/uploads/2013/01/GRF_Implementation_Guide.pdf

American College and University President's Climate Commitment, Energy Performance Contracting Financing Options – This paper offers a detailed overview of the various financing options for Energy Performance Contract (EPC)-based projects and a description of the option's related cash flow mechanics.

http://www2.presidentsclimatecommitment.org/documents/ccitoolkit/Energy_Performance_Contracting_Financing_Options.pdf

Borgeson, Merrian, and Zimring, Mark. "Financing Energy Upgrades for K-12 School Districts: A Guide to Tapping into Funding for Energy Efficiency and Renewable Energy Improvements" – This guide focuses on clean energy financing options for K-12 school decision makers who are considering investments in high performance school projects.

<http://emp.lbl.gov/sites/all/files/lbnl-6133e.pdf>

REBATES AND INCENTIVES

The Database of State Incentives for Renewables and Efficiency (DSIRE) - This database provides a comprehensive source of information on incentives and policies that support renewables and energy efficiency in the United States.

<http://www.dsireusa.org/>

MEASUREMENT AND VERIFICATION RESOURCES

U.S. Environmental Protection Agency's Energy Star Program, "Sub-Metering Energy Use in Colleges and Universities: Incentives and Challenges" - This paper examines the technical and economic benefits of sub-metering individual campus buildings.

http://www.energystar.gov/ia/business/higher_ed/Submeter_energy_use.pdf?16a2-be27

Lawrence Berkeley National Laboratory Measurement and Verification Portal -

This website provides resources and tools to perform and support energy savings measurement and verification techniques.

<http://mnv.lbl.gov/>





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ABOUT THE ENVIRONMENTAL FINANCE CENTER

The Environmental Finance Center at the University of North Carolina, Chapel Hill is part of a network of university-based centers that work on environmental issues, including water resources, solid waste management, energy, and land conservation. The EFC at UNC partners with organizations across the United States to assist communities, provide training and policy analysis services, and disseminate tools and research on a variety of environmental finance and policy topics.

The Environmental Finance Center at the University of North Carolina, Chapel Hill is dedicated to enhancing the ability of governments to provide environmental programs and services in fair, effective, and financially sustainable ways.

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ABOUT THE JESSIE BALL DUPONT FUND

The Jessie Ball duPont Fund works to expand access and create opportunity by investing in people, organizations and communities that were important to Jessie Ball duPont. The Fund's grantmaking is organized around three bodies of work:

- Building organizational capacity;
- Building the assets of people, families and communities;
- Strengthening the nonprofit sector.

The Fund makes grants to a defined universe of 330 eligible organizations identified by Mrs. duPont in her will. The Fund has assets of more than \$250 million and has awarded more than \$318 million in grants since 1977.

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